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IN TWO SECTIONS

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EDITORIAL DEPARTMENT NOTE

The flexible budget is usually thought of as a device for the control of manufacturing expense or overhead. In a few cases it has been applied to the control of selling expenses. While some companies use this type of budget in controlling indirect labor costs as a subdivision of manufacturing expense, we know of no published material dealing with the application of flexible budget methods to the control of all labor costs. This is the field covered by the article in this issue of the *Bulletin* which describes the methods used by the Manville-Jenckes Corp. in controlling labor costs. We feel certain that the reader will secure from this article a new insight into the possibilities in the flexible budget approach to cost control.

The authors of this article are William Haskins, Jr., Controller of the Manville-Jenckes Corp., and Frank F. Gilmore, Assistant in Business and Engineering Administration at the Massachusetts Institute of Technology. Mr. Haskins began his business career with the Sayles Finishing Plants in 1908 doing time study and job analysis work under the Gantt System until 1916 when he went with Brown and Sharpe Mfg. Co., to specialize in stock control work. Two years later he joined his present company to work in the rate setting and stock control area and in 1921 became cost accountant for his company. Four years later Mr. Haskins was promoted to the position of Controller and since that time has been very active in the development of the company's budgetary program.

Following his graduation from the Massachusetts Institute of Technology in 1933, Mr. Gilmore spent two years in the factory training course of the Taunton Pearl Works, during which he worked in all departments of the company. The following two years were spent with the York Ice Machinery Corp. where Mr. Gilmore served as Assistant to the Production Engineer and had charge of stockbuilding and aided in inventory control, and with the Armstrong Cork Co., where he again engaged in production scheduling and inventory control work. Returning to M.I.T. in 1937, Mr. Gilmore became Assistant in Business and Engineering Administration, working directly with Professor Edwin H. Schell, Head of the Department. During this period he pursued graduate work and was co-author with Professor Schell of *Manual for Executives and Foremen* published by McGraw-Hill last year. Since last July, Mr. Gilmore has been Assistant to Professor Wyman P. Fiske, Director of the Sponsored Fellowship Program of M.I.T. He is an Associate Member of the Society for the Advancement of Management.

Articles published in the *Bulletin* present many different viewpoints. In publishing them the Association is not sponsoring the views expressed, but is endeavoring to provide for its members material which will be helpful and stimulating. Constructive comments are welcomed and will be published in the Forum Section of the *Bulletin*.

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NATIONAL ASSOCIATION OF
COST ACCOUNTANTS

APRIL 15, 1940

A CASE STUDY IN BUDGETARY CONTROL

By William A. Haskins, Jr., Controller,
Manville-Jenckes Corp., Manville, R. I.

and

Frank F. Gilmore, Assistant in Business & Engineering Administration,
Massachusetts Institute of Technology, Boston, Mass.

Company and Products

THE Manville-Jenckes Corporation is a textile mill producing cotton and rayon grey goods. The company employs approximately 2,100 people at the normal operating level of 80 hours per week under two shifts of operation. At this rate of activity, 1,400 looms turn out about 350,000 yards of rayon per week, and 1,900 looms produce approximately 650,000 yards of cotton, making a sales volume at current prices of around $130,000 per week or roughly $6,500,000 per year.

Cotton is processed completely from the raw state at the main plant. Rayon manufacture, however, is divided between a branch plant in another town and the main mill. Rayon yarn is manufactured in the nearby division, which produces approximately 75 per cent of the requirements for standard output. The remaining 25 per cent of the yarn required is purchased from other manufacturers. This is an example of the successful integration of industry in that the rayon yarn market is bridged in a very effective manner. The arrangement permits fluctuation in the use of yarn through a considerable range, with the company's rayon plant operating at normal capacity on the yarns that are steadily used, thus making for lower unit costs.

Due to the fact that 95 per cent of the cotton business is manufactured to order or to contract, the production curve for cotton must follow the sales curve very closely. On the other hand, only 25 per cent of the rayon goods are special order merchandise, and a steadier production load is possible in the manufacture of these lines. Cotton production may vary from 60 per cent of normal

capacity to 120 per cent in a typical year. Inasmuch as the philosophy and technique of control is identical in both fields, and the more interesting problems arise in the cotton division because of the wide variations in volume, this paper will be concerned only with the problems arising in the processing of cotton.

Importance of Labor Costs

A further refinement in scope arises from a consideration of the relationships between the various items of manufacturing cost in the following breakdown, showing the major items as cents of the average sales dollar:

Raw materials	27¢
Manufacturing labor	34¢
Clerical and oversight payroll	9¢
All other manufacturing costs	22¢
Commercial costs and profit	8¢
Total	100¢

The company feels that direct and detailed control of labor costs by jobs is essential, whereas such detailed control of items which fluctuate more or less sporadically with changes in volume is not feasible, comparison against standards based on past history being sufficient in the latter cases. For purposes of control, all expense items have been segregated into five major divisions as follows:

1. Materials
2. Manufacturing Labor (Direct and Indirect)
3. Supplies
4. Variable Expenses (Other than Labor)
5. Fixed Expenses

Because of the importance of manufacturing labor, as indicated in the figures quoted above, and because of the interesting aspects of the control mechanism, this paper will be confined to a discussion of the structure and operation of the budget for the control of manufacturing labor costs in the production of cotton grey goods.

Control Methods

All labor employed in the factory in the manufacture of goods is controlled through the "Payroll Control Budget." Detailed standards are used for the purpose of measuring actual performance. This measurement takes the form of "Comparison Reports" issued by the budget director on Tuesday of each week for the previous week. Comparison reports are sent to the overseers or department managers for the major operating departments of the mill. Each report shows a detailed breakdown of the direct and indirect labor as to occupation. Against these occupations is entered the standard labor dollars for the operating level attained, thus serving as the budget. The actual payroll is entered in the actual column, and the gain or loss resulting is shown in the next two columns.

The comparison reports which are sent to the various operating department heads are compiled into "Summary Reports" for purposes of study and action by the president, controller and superintendent.

It is our purpose in this paper to present the underlying detailed structure of the budget figures appearing in these reports and then to discuss some aspects of the operation of the plan from an administrative viewpoint.

The Company has very generously permitted the use of actual figures throughout this entire paper, so that current actual conditions are portrayed.

Structure of the Budget

Standard Volume

The cotton grey goods division is operating on a standard volume basis determined by the production of the weaving rooms when running 80 hours per week. This involves two shifts of operation in the weaving rooms, and the earlier stages of production such as carding, spinning, spooling and warping, etc., have been adjusted, through capacity studies, to this limiting factor.

Two major factors led to the setting up of this standard volume, namely, the N. R. A. and the pressure of declining prices in the face of heavy fixed costs. Under the National Recovery Act,

the Textile Code specified that the limit of time looms could be run was 80 hours per week. This had a strong influence on the choice of a standard volume because of the capacity studies made at the time and because of the second factor, declining prices throughout the textile industry, which made large volume imperative if fixed costs were to be absorbed. Careful studies were made to determine what conditions had to be met if a satisfactory profit were to be made at this level of operations.

Determination of Labor Standards

The underlying philosophy of the management of this company is that both direct and indirect labor costs should be thought of as varying proportionately with changes in the level of operating activity. Hence, the basis of the control of labor is the detailed preparation of standards for every unit of labor to be met under the conditions of all different types of goods manufactured. A unit of labor or service may be defined as the number of man hours of labor required to perform an operation in a specific manner on one unit of product. The cost of a unit of service is simply the standard cost of the operation involved reduced to a unit-of-product basis. Thus if the elements of manufacture are broken down into sufficiently small divisions, a set of basic data may be determined which will permit the building up of the standard or budgeted cost for any quantity or mix of products produced.

The standard costs and production unit data have been developed over the past ten years through careful study of past operations, comparisons with actual results and studies of capacity relationships. These standard data are maintained in a "Labor Standards Book" comprising seventy-six pages of material. These data are all figured on the basis of the normal 80-hour week and reduced to base units for further calculation and use under varying conditions of load and type of material being processed. Bases for absorption through standard costs are indicated.

While the standards have been in the process of evolution for the past ten years, the past five years, since the setting up of the payroll control budget, have seen the most concentrated effort on the part of the management and the overseers to reduce standards at every point possible. Although a very substantial reduction in

unit costs has resulted from these efforts, it should be emphasized that the savings were made in the amount of labor required per unit of product and not through any reductions in real wages.

Development of Cost Sheets

The standards which appear in the labor standards book are only the initial or basic step in the development of usable figures. Because of the very large number of different constructions of cloth manufactured by the Company and because each construction requires a different utilization of the facilities of production, it has been found necessary to introduce an intermediate step in the form of a cost sheet.

A cost sheet is prepared for each construction of goods manufactured, and gives the detailed unit cost figures for that pattern. Because of the important part played by these sheets, a typical one will be described in detail. Exhibit 1 shows the cost sheet for Style 2000 (fictitious style number). At the top of the sheet a complete description of the specifications of the fabric is given. The sheet is then divided into parts in which are figured the cost per pound of the yarns, the warp preparation cost, the cost per yard of goods of the yarns, and so on, until the final cost is obtained. The unit appearing in this sheet is known as a point or one-hundredth of a cent. In other words, 100 points would be equivalent to one cent, or 10,000 points would equal one dollar.

Cost Per Pound

The first step in the preparation of a cost sheet is the determination of the cost per pound of the warp and filling yarns. In the example shown, it will be seen that the number of ends or picks involved in the pattern was figured as a basis for the determination of the other costs. We find that the warp is made up of 2,026 ends of 45CP37. The material cost per pound for this type of yarn is 1,744 points or 17.44 cents. This figure has been developed elsewhere through careful measurement. The labor cost per pound of 979 points is derived from the labor standards book by adding the cost of the required units of the various types of direct and indirect labor per pound of warp as developed in Exhibit 2. Returning to Exhibit 1, the fixed expense of 374 points

MANVILLE MILL - COST SHEET. 1n 39 1/2"

Inquiry No. For Date 7/19/38 Style No. 2000

Fabric Marquisette Construction 39 1/2 52 × 32/24 – V/P

Type Loom C & K No. Looms 8 Speed 138 Eff. % 75 Yds. per Lm. wk. 431

Bale Cotton Price 27-14 Slap Rayon Price Slap

YARNS 32-11 1/2

KIND		Ends or Picks	Material	Labor	Fixed Expense	Variable Expense	Total	Lbs. per 100 Yds.	COST PER YARD Material	Labor	Fixed Expense	Variable Expense	Total
45CP37	Wp.	2026	1744	979	374	278	3375	5.68	99	56	21	16	192
45/2 sel	Wp.	72	1772	1594	629	346	4373	.40	07	06	03	01	17
	Wp.	2098					70	6.08				04	04
	Wp.												
	Sel.												
50CP37	Fil.	24	1736	846	308	253	3174	241	42	20	07	06	75
8KP32	Fil.	8	1294	377	88	53	1812	503	65	19	04	03	91
	Fil.	32											
	Fil.												

Warp Preparation per Yard	Labor	Fixed Expense	Variable Expense	Total
Top Spool				
Slashing Top Beam				
Slashing Bottom Beam	055	037	020	112
Drawing-in 485	113	029	009	151
Twisting-in 218	051			051
Starting Up 725;4300	169			169
Samples	100			100
TOTAL	488	066	029	583

WARP PREPARATION	Material	Labor	Fixed Expense	Variable Expense	Total
		49	07	03	59
Weaving Piece Work		119			119
Weaving Day Labor & Exp.		80	33	21	134
Shearing		10	03	02	15
Cloth Room		34	07	01	42
Packing Material				03	03
Tax 444		17			17
TOTAL	393	213	410	85	60	768

Weaving Piece Rate .01032	Allowance for Defectives 185	04	08	02	01	15
Weaving Day Labor 28786 ÷ 57 = 344.86	Factoring %				10	10
Weaving Fixed Exp. 142	Selling Commission %				09	09
Weaving Var. Exp. 91	TOTAL	217	418	87	80	802
Warp Crimp 577.86	Selling Fixed Expense			08		08
Reed Space 43.1	Administrative %			14		
	Depreciation			17		31
	Full Cost per Yard	217	418	126	80	841

WARP INVENTORY VALUE	Cloth Yard Cost	Warp Yard Cost	Warp Yard Slap
Top Beam			
Bottom Beam			

BASIS OF CALCULATION

Section Beams Yards Loom Beams Yards

Minimum Order 10-2T

Form 188

Loom Fixers .41
Smash Piecers .05
Battery Hands .13
General No. 1 .21

EXHIBIT 1

EXHIBIT 2

DEVELOPMENT OF WARP LABOR ON COST SHEET
45CP37

On Section Beams

	Cost of Operation (from Standards Book)	*Waste Allowance*	*Total Labor Cost (Cents)*
Opening and Picking	.149	...	.149
Carding	.689	.015	.853
Combing	.664	.188	1.705
Drawing	.196	.009	1.910
Slubbers	.140	.010	2.060
First Intermediates	.365	.050	2.425
Second Intermediates	.839	...	3.264
Warp Spinning	2.826	.065	6.155
Foster Winding	2.809	.062	9.026
High Speed Warping	.480	.285	9.791

represents the proper portion of the prorated fixed expenses of the factory at standard volume. The same thing applies to the variable expense of 278 points. These two figures are derived from fixed and variable expense standards which have been determined for control purposes, but which have been prorated for absorption purposes on the basis of standard volume and standard mix of products. Questions naturally arise regarding departures of actual volume from standard volume and changes in the proportionate amount of production of the pattern in question from the proportion assumed to be normal in prorating the fixed and variable expenses or overhead. These variances, when taken for the production mix as a whole, will give a measure of departures from standard volume and standard mix in the form of over- or under-absorption of overhead. The control of these expenses, however, will not be impaired seriously by such departures from standard, as the budgets are tied to measuring sticks which avoid the issue.

These points are then added, giving a total of 3,375 points as the cost per pound of No. 45CP37 warp yarn.

Conversion to Cost per Yard

In the next column to the right appears the conversion figure of 5.68 pounds per hundred yards of cloth, or .0568 lbs. per yard. In other words, by multiplying .0568 times the figures just de-

termined, the detailed cost per pound is converted to cost of the warp yarn required to make up a yard of cloth. Thus we find a material cost per yard of 99 points, a labor cost of 56 points, fixed expense of 21 points, variable expense of 16 points, and a total cost per yard of 192 points.

The same procedure is followed in the figuring of the other warp yarn and the two filling yarns, giving the figures shown.

In the middle of the page, on the left side, is shown the method of figuring the cost per yard of warp preparation. Here the material cost is omitted, as it has just been figured above. The labor cost of the different operations in warp preparation is brought over from the labor standards book and is shown in terms of points in the labor column. A prorated unit cost in points for fixed and variable expenses for these departments is shown, all together making up the total cost per yard of warp preparation of 58.3 points. The figures for labor, fixed expense, variable expense and the total cost are carried over to the right side of the page, opposite "Warp Preparation," to be added into the total cost of the fabric.

Similar procedures are followed for figuring the weaving piece work costs, weaving day labor and expense, shearing costs, cloth room costs, and packing material costs. Allowances for defectives, factoring cost proration, selling commission costs, fixed selling expense proration, administrative proration and depreciation proration are then added in to arrive at the full cost per yard shown at the foot of the columns at the right side of the page.

Here we have a breakdown of the different classes of cost which go to make up the total per yard cost of this particular fabric. It will be noted that material comprises about 25 per cent of the total, labor approximately 50 per cent, fixed expense 15 per cent, and variable expense about 10 per cent. Labor cost happens to be high in this case, other patterns showing different relationships. It will be remembered that earlier it was stated that the average labor requirement was about 34 cents of the sales dollar or 34 per cent.

Weaving Day Labor and Expense

In addition to the data leading to total cost per yard figures, the cost sheet is utilized to show a breakdown of the weaving day

labor and expense, as these data are needed each week in computing the standards for the comparison reports. The loom fixers', battery hands', smash piecers' and indirect labors' cost per yard figures shown in the center of the sheet at the bottom are derived from the labor standards book, which shows the total grey goods cost per loom week for weaving to be 287.86¢ for the C & K Dobby Loom. This figure is shown on the cost sheet opposite weaving day labor in the lower left portion of the sheet. To this is added 57¢ for battery hands, making a total of 344.86¢ per loom week. Dividing this figure by the yards per loom week, 431, gives a total weaving day labor and expense of .80¢ yer yard.

Dividing the battery hand cost per loom week of 57¢ by yards per loom week (431) gives the cost of .13¢ per yard shown at the foot of the page. Subtracting this .13¢ from the weaving day labor of .80¢ gives .67¢ to be distributed to the loom fixers, smash piecers and indirect labor. The labor standards book shows the percentage of each of these items to total under standard conditions, and these percentages are utilized to break the .67¢ down into .41¢, .05¢ and .21¢, as shown at the foot of the cost sheet.

Use of the Cost Sheet

A major use for the cost sheet lies in the converting of the standard data found in the labor standards book into budget figures for different levels of operating activity. In other words, cost per pound and cost per yard figures at the different stages of manufacture for each of the fabrics being processed may be taken from these sheets instead of figuring the costs from the basic data each week. Thus yards, pounds or other units of production times the cost per unit on these sheets for the fabrics involved will give the total allowable standard labor dollars at that particular output.

A second valuable use of the cost sheet is found in deciding the question of whether or not business should be taken. For example, if business were at a low level and any volume would sell at prices above differential costs, it would be welcome in order to absorb some of the fixed charges and thus minimize the losses involved. It may be seen from the sheet that any price above 715 points or 7.15 cents per yard would be worth taking. In other words, management is in a position to know at any time just how

the company is doing as far as income and outgo per product are concerned.

Typical Routine in the Preparation of Reports

The detailed work of developing the standard budget for each week's activity is, as might be expected, a rather lengthy job. In order to illustrate the method, the clerical work necessary each week to prepare the comparison report for the overseer of the cotton weaving room will be partially traced.

Two preliminary steps must be taken in order to arrive at the budgeted amounts shown in the standard column in the report. A working sheet for labor comparison must be filled in, from which the distribution of general labor may be computed. The resulting figures may then be transferred to the comparison report.

In addition, working sheets must be prepared for the different types of looms and patterns, production for one week involving 200 or more different patterns or styles. The total figures for all styles produced in the week form the basis for the budget. For the sake of simplicity, one style will be figured.

The Working Sheet

On the working sheet (see Exhibit 3) it will be seen that 17,193 yards of Style 2000 were produced. Turning to the cost sheet shown in Exhibit 1, we find that the weaving piece rate for this style is .01032 or 119 points, which is equivalent to 1.19¢ per yard. This figure is carried over from the cost sheet and multiplied by the yardage produced to obtain $204.60 as the weaving cost for this style for the week.

To determine loom fixers' cost, the cost per yard shown on the cost sheet at the foot of the page is extended to give a cost of $70.49 (.41 x 17,193). Similarly, the costs for battery hands, smash piecers, and indirect labor (shown on the working sheet as General No. 1) may be obtained by extending the unit cost by the yardage. The changing cost is brought over from the cost sheet as .17, giving a cost of $29.23.

Thus the cost sheet for each of the different styles woven during a particular week will furnish the unit cost for the operation based on standards, which may be used to determine the allowable cost or budget for the yardage produced.

WORKING SHEET FOR LABOR COMPARISON

Sheet No. 1 C & E Dobbs Working Room No. 1 & 2 (Cotton) Week ending Feb. 3, 1940

Clock Group No.	Style	Production in Dozens	Spinning		Card Grinder		Drawing Tenders		Spinners Helper		Slubbers		Pulley Changers		Card Fixer		Operators No. 1		Operators No. 2		Operators No. 3		Operators No. 4		
			Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Amount	
	30565	17193	1.19	$204.60	.41	$70.45	.05	$8.60	.13	$22.33	.17	$29.23					.21	$36.16							

EXHIBIT 3

WEAVE NO. 1 & 2

Standard Looms 1950
Actual First Shift 1464
" Second " 1469
" Third " 1385
4318

Standard Yards 500.000
Actual " 674.141

Week Ending Feb. 3/40

OCCUPATION	CODE	STANDARD	ACTUAL	GAIN	LOSS
Oversight & Clerical	001	$654.91	$706.54		$51.63
DIRECT					
Weavers	135	7626.74	7610.88	$15.86	
Twisters In	123	485.70	485.70	----	
Spool Boys	124	8.04	19.49		11.45
Total Direct		8120.48	8116.07	15.86	11.45
INDIRECT					
Fixers	206	3458.35	3483.76		25.41
Oilers	207	65.52	59.04	6.48	
Cleaners	208	146.98	151.31		4.33
Sweepers	209	102.71	95.54	7.17	
Waste Man	219	15.05	15.66		.61
Inspectors	235	641.08	659.51		18.43
Miscellaneous Men	250	116.88	97.09	19.79	
Smash Piecers	260	437.97	441.12		3.15
Battery Hands	261	1553.54	1486.40	67.14	
Filling Carriers	264	293.08	277.41	15.67	
Warp Truckers	266	73.49	57.70	15.79	
Cloth Truckers	267	33.65	32.08	1.57	
Head Filling Man	268	19.48	11.83	7.65	
Filling Conditioner	269	32.76	30.86	1.90	
Filling Conditioner Help	270	13.28	13.16	.12	
Jacquard Head Cleaner	271	8.14	5.57	2.57	
Harness Repair Man	272	15.30	----	15.30	
Doupe Repair Man	273	78.53	93.07		14.54
Head Twister	275	38.96	23.57	15.39	
General Repair Man	276	11.51	11.24	.27	
Instructors & Students	305	215.18	202.98	12.20	
Cut Stampers		51.04	51.04	-----	
Total Indirect		7422.48	7299.94	189.01	66.47
Total Direct & Indirect		15542.96	15416.01	204.87	77.92
Net Gain		126.95		126.95	
Learners			21.95		
Allowances			.82		
Samples			365.56		
Changing		1508.13	884.94	623.19	
Extra Work			.86		
Inventory			26.73		
TOTAL PAYROLL			17423.41		

% of Actual to Standard 99.2%
% of Actual Indirect to Direct 89.9%
% of Relative Activity 93.5%

Std Loom Hours 156,000
Act. " " 179,464

EXHIBIT 4

EXHIBIT 5

COTTON WEAVING

Code No.	*Distribution of General Labor*		Week Ending *Feb. 3/40* *Percentage*	*Amount*
	General No. 1			
235	Inspectors		27.4	231.37
264	Filling Carriers		16.3	137.64
	Miscellaneous		56.3	475.42
	Total		100.0	844.43
	General No. 2			
271	Jacquard Head Cleaners		7.5	8.14
272	Jacquard Harness Repairer		14.1	15.30
235	Inspectors		29.5	32.00
264	Filling Carriers		11.0	11.94
	Miscellaneous		37.9	41.12
	Total		100.0	108.50
	General No. 3			
273	Doupe Repair Man		8.6	78.53
235	Inspectors		39.3	358.87
264	Filling Carriers		11.7	106.84
	Miscellaneous		40.4	368.91
	Total		100.0	913.15
	General No. 4			
273	Doupe Repair Man		4.3	
235	Inspectors		69.5	
264	Filling Carriers		5.9	
	Miscellaneous		20.3	
	Miscellaneous			
207	Oilers	57.96	7.4	65.52
208	Cleaners	130.41	16.6	146.98
209	Sweepers	91.00	11.6	102.71
219	Waste Men	13.00	1.7	15.05
250	Miscellaneous Man	104.00	13.2	116.88
266	Warp Truckers	65.56	8.3	73.49
267	Cloth Truckers	30.00	3.8	33.65
268	Head Filling Man	17.00	2.2	19.48
269	Filling Conditioner	28.80	3.7	32.76
270	Filling Conditioner Help	11.70	1.5	13.28
275	Head Twister	34.84	4.4	38.96
276	General Repair Man	10.50	1.3	11.51
305	Instructors & Students	192.00	24.3	215.18
	Total	786.77	100.0	885.45

% of Relative Activity

Full Standard Miscellaneous	841.84
Absorbed Standard Miscellaneous	885.45
% of Relative Activity	93.5%

The Comparison Report

The totals of the various columns on the working sheet are brought over to "Weave 1 and 2 Comparison Report" (Exhibit 4), with the exception of oversight and clerical which are considered fixed for a long period, and some of the indirect labor costs. These latter costs are obtained by spreading the General No. 1 amount on the sheet for "Distribution of General Labor" shown in Exhibit 5. For the week of February 3, 1940, for example, the total for one group of styles for General No. 1 was $844.43. Other groups of styles were figured in the columns for General No. 2 and No. 3, different components being involved. Under General No. 1 in Exhibit 5 the total was broken down according to percentages taken from a page of the labor standards book. The totals in General No. 2 and No. 3 were similarly distributed. The miscellaneous amounts under these three heads were totaled to give a figure of $885.45 which was then distributed according to the percentages shown in Exhibit 5, thus obtaining standards in proportion to the labor requirements at standard volume.

These figures were then carried over to the "Weave 1 and 2 Comparison Report" shown in Exhibit 4 in the standard column, the complete array serving as the detailed budget or standard for the styles and yardage actually produced during the previous week.

In summary, the steps necessary to derive the standards or budget for the cotton weaving room for a week's production are as follows:

1. Various styles woven during the week are listed in the style column of the working sheet together with the yards of production.
2. The allowable cost per yard for each style and for each class of labor is entered from the respective cost sheets on file.
3. Labor costs for each style are obtained by multiplying the cost per yard by the yards woven.
4. Costs are totaled and all items except general labor are transferred to the comparison report.
5. General labor is distributed on the cotton weaving distribution sheet and the resulting figures are transferred to the comparison report.

The work ordinarily requires from 5 to 6 man hours for this comparison report. Similar procedures are followed for the other comparison reports, but in most cases the job is less complex and requires much less time. Comparison reports are made up each week for the following departments:

Carding department
Spinning department
Spooling and warping
Twisting and winding
Slashing-drawing-in department
Rayon spooling, warping and quilling
Weave 1 and 2 (cotton)
Rayon weaving 3 and 4
Rayon weaving 5
Shearing
Cotton cloth room
Rayon cloth room

Summary payroll control reports are prepared each week for the superintendent, controller and president. These summaries show the total results for each department and for the mill as a whole.

The paper thus far has been concerned with the structure of the budget utilized by the Manville Jenckes Corporation. The next section will describe the operation of this budget and the administrative planning and control which this groundwork of reliable underlying data makes possible.

Operation of the Budget

Use of Comparison Reports

The work of establishing the budget, of calculating the actual costs, and of subsequently analyzing the payroll and related reports, together form a basis which enables the management of the Company most profitably to exercise economic control, provided, of course, that this work is always supported by a sound, aggressive, and consistent program of utilization.

In an address before the New York Chapter of the National Association of Cost Accountants, Fred W. Shibley, who is Chair-

man of the Board of the Manville-Jenckes Corporation, said, "In a well conducted business, management and cost accounting are two interlocking functions of the first magnitude. Each is a necessity of the other. Personally, I could not think of operating an industrial business without a budget before my eyes and a trained cost accountant at my elbow. He and I would be intimate friends." Carrying out this thought, the management of the Company makes full use of all factual data supplied by the cost division, as it has found from experience that such records definitely direct attention to sources of large savings.

The payroll comparison reports, showing the results of the preceding week, are sent to the overseers of the various operating departments, copies going to the superintendent. Each overseer studies his report in detail, marking down the reasons for losses and what action he will take to adjust them. Incidentally, the Company is not particularly interested in an explanation of the reasons for losses, but it is very definitely interested in what action is contemplated to eliminate them permanently and how gains can be realized. The superintendent holds conferences with each overseer on the variances shown, after the latter has had an opportunity to look over his report, thus making it possible for the superintendent to review all the bad spots in the plant in a minimum of time. This provides the continuous follow-through of the plan. Active steps are arranged where possible for the immediate correction of the adverse variances. Another point is that the overseer is free to exercise unlimited initiative in the managament of his department, a policy which, the Company believes, is the basis on which maximum results are to be obtained. These weekly statements set forth in detail a clear-cut measurement of the overseer's performance.

The reason for the effectiveness of these statements is that each one concerned understands the position of importance in which he has been placed by the management. He also knows that the president and controller spend sufficient time to fully comprehend the outcome. In other words, each man realizes that management is intimately familiar with just what he is doing from week to week, and he also knows that a major portion of his success with the organization depends on the outcome of this report.

Finally, a consolidated statement showing total departmental results is sent to the president, controller and superintendent, who study these reports very carefully each week. Most of the routine contact with the overseers is left in the hands of the superintendent where it properly belongs, supplemented by conferences where necessary on the part of the budget director. The president reviews the weekly summary budget with the controller, and passes on to him suggestions for improvements. The controller in turn takes these up with the vice-president in charge of manufacturing and the superintendent. In important cases a meeting of these four is called for discussion. Periodically, the president and controller hold joint conferences with the superintendent and overseers to sum up the score of gains and losses and review the standing of various overseers. The president reviews the progress made and offers constructive suggestions which are very interesting and helpful to each one. The underlying purpose of these meetings is to stimulate co-operation through words of encouragement and congratulation to the staff. The net result of these meetings is that the overseers go back on the firing line revitalized with more intensified enthusiasm to achieve greater savings.

Co-operation

Co-operation is vital to the ultimate success of this plan of budgetary control, and it is secured only through the carrying out of certain conditions. First, it is important that the president know the overseers on intimate terms so that contacts may be pleasant and informal. Second, the overseer must completely understand the fundamental construction of his departmental cost. Third, he must participate in the formation of his budget. Fourth, he must give intelligent thought and study to the comparison reports.

These steps make him a partner in the plan, and he naturally feels that the budget is his budget; he has no question regarding its equity, as he has previously approved it. In other words, if he is consulted, given an opportunity to understand completely the plan, and made a real partner in the undertaking, a high degree of co-operation will be forthcoming. As it has actually worked out in this Company, each overseer enthusiastically looks forward to the receipt of his next report.

Under this process, gains become predominant, as costs are slowly pulled down, and in time a revision of the budget is advisable. The overseers then meet with the president and the controller to establish a lower objective. The overseers are in accord with the revision policy of the Company, as they fully realize that costs must continually be reduced to combat declining margins. However, they also feel very strongly on the question of quality; when efforts are made to reduce standards to a point where the overseer feels that quality will have to be sacrificed in order to meet the standard, he opposes the reduction. This viewpoint is of course parallel to management's own aims, so that agreement is easily reached. As long as it is felt that further improvement can be attained, the overseers co-operate in reductions of standards.

Variances and Improvement

As has been suggested above, the overseers constantly strive to show gains on their comparison reports. This philosophy has been instilled by the management because of the absolute necessity for cost reduction of a drastic nature. Strong emphasis has been placed on positive variances, and any continued showing of such variances has resulted in more than equivalent reductions in standards, thus stimulating further improvement. The president feels that the purpose of the budget is to bring about improvement. As long as progress is made he is pleased, but he is never satisfied with the results. Each overseer has been impressed with the fact that he is paid to make things better, not to keep them as good as they have been. The danger of less than adequate spending apparently has not shown itself in any deleterious effects.

However, overseers and management alike realize that there are limits to the degree to which standards may be cut and quality still maintained. The time is fast approaching when reductions must be sought in other areas. Technical improvement in the industry holds possibilities through replacing equipment with more efficient units which will pay for themselves out of savings in a short period of time.

That the periodic reductions in standards as a result of the constant drive for favorable variances have produced results, is amply illustrated by the fact that during the last five years unit

EXHIBIT 6

REDUCTION IN OPERATING LABOR STANDARDS

Date	*Weekly Operating Labor at Standard*	*Reduction*	*Relative Percentage*
Dec. 1934	$56,856.70	...	100.0%
April 1935	51,171.03	10.0%	90.0
Jan. 1936	43,495.38	15.0	76.5
April 1937	42,471.95	2.2	74.7
April 1938	37,752.85	11.1	66.4
July 1939	36,900.00	2.2	64.9
Reduction per week 1934-39	$19,956.70		35.1%

operating labor costs have been reduced 35 per cent without any reduction in real wages. Exhibit 6 shows the reductions which have been accomplished since 1934, based on current operating volume of approximately 1,000,000 yards per week and a total operating labor budget of $36,900. If we assume the same level of operation for 1934, the operating labor would have been $56,856.70. If this amount is made 100 per cent, we find today's budget at 64.9 per cent of the standard operating labor cost of six years ago. Reductions were made in varying amounts during the five years since 1934, as shown in the column marked "Reductions," these percentages being applied to the existing standards at the respective dates.

The significance of these reductions is apparent when it is realized that at current volume the saving amounts to nearly $20,000 per week, or approximately $1,000,000 per year. On a yardage basis, this would mean an average saving of about 2¢ per yard on goods selling today at only 13¢ per yard.

It is of interest to note that this reduction in unit labor costs of 35 per cent has been accomplished from standards established in 1929 by an engineering firm which thoroughly studied the Company.

The effectiveness of the standards in measuring actual efficiency is shown by the smallness of the variances appearing on the sample budget shown in Exhibit 4. Being based on unit-of-service costs for both direct and indirect labor, the amounts appearing in the budget reflect what actual costs really should be and thus serve as excellent means of control.

Administrative Uses of Variable Statistics

The development of detailed and accurate standards has made available a body of reliable statistics which the company is utilizing very effectively in administrative planning and control. The major activity carried on in this area is a monthly projected profit and loss statement. This statement shows a comparison of the past month's actual operating performance with the forecast for that month together with a forecast of the coming three months.

Buying cycles based on past experience are of little value today as a guide because of the wide fluctuations in buying movements. In projecting sales volume 90 days in advance, it is necessary to consider all contributing factors which are expected to influence demand. Thus the most forward month's forecast contains a certain amount of speculation, but if this is conservatively done, and an unusually sharp change in buying does not occur, the sales figure can be fairly well approximated.

The purpose of the monthly projected profit and loss statement is to enable the board of directors and the management of the Company to visualize the minimum results to be expected from the operations of the near future in time to make adjustments for adverse conditions before they develop. The report is issued on the 12th of each month, showing the actual results for the month just passed, and forecasts for the current and two succeeding months. Each new forecast for a particular month will reflect the more complete data available as the period approaches, so that these statements are reliable indicators in proportion to their proximity to the current period.

The projected analyses lend themselves to a close and comprehensive study of earnings in advance, and, when profits decrease, the fact is less disturbing, if one is forwarned, than if a statement were not issued until after the books were closed for the month.

An individual forecast will not convey the scope of information required for the exercising of close control. It is rather the continuity of these statements and the continual review and study of the data, which form a background of intimate knowledge, from which decisions can be made resulting in the best possible earnings.

Steps in Forecasting

These statements are built up by first contacting the sales manager for his estimate of dollar volume. Against this is applied the standard cost of sales. Then, from the record of variances from standard on the comparison reports, furnished by the cost division, the operating gains or losses expected to accrue over this period are projected. The anticipated operating level is determined so as to estimate the under- or over-absorption of fixed charges.

Thus it is possible, on the basis of the dependable cost data explained in the first section of this paper, to project definite earnings statements. In the past they have shown results of never less than estimated, and usually within less than 1 per cent of sales higher than the actual earnings.

In order to illustrate the method, the statement issued December 12, 1939, will be explained in some detail. Turning to Exhibit 7, which is the working sheet leading up to the projected profit and loss statement, we find the first item to be projected is sales or, as listed, "Gross Sales before Discounts." This estimate for the coming three months is obtained from the sales manager. It will be noted that the data for cotton grey goods and rayon grey goods are developed separately on this sheet.

The estimated selling expense is then entered. This amount can be figured very closely, as there is a fixed cost per week plus a brokerage charge based on a percentage of sales.

The standard cost of sales can be arrived at by an extension of the projected yardage sales by the standard costs described in the first section of this paper, if this is made necessary by unusual circumstances. However, the more common procedure is for the controller to make an estimate of the cost of sales based on projected gross margin trends. The controller receives a daily sales report which keeps him well informed as to the per cent of change in margins. Things which affect margins are price changes, changes in standards, and changes in raw material costs. This estimate must then be tied in with the relative proportion of different types of goods which are selling heavily at the time, or which show changing trends. Experience has proven that this method of estimating cost of sales as a rule enables as accurate

EXHIBIT # 317
WITNESS # 36

DETAIL OF MARVILLE MILL PROFIT AND LOSS FORECAST

All Businesses - NOVEMBER ACTUAL - DECEMBER 1939 - JANUARY - FEBRUARY 1940

	COTTON GREY GOODS				RAYON GREY GOODS							
	NOVEMBER ACTUAL	DECEMBER	JANUARY	FEBRUARY	NOVEMBER ACTUAL	DECEMBER	JANUARY	FEBRUARY	TOTAL NOVEMBER			
Gross Sales Before Discounts	$ 327,979	$ 300,000	$ 310,000	$ 220,000	$ 371,142	$ 300,000	$ 270,000	$ 200,000	$ 709,021			
Selling Expense	4,991	4,000	4,000	3,000	6,000	5,000	5,000	4,400	10,791			
Net Sales After Selling	335,287	296,000	306,000	221,000	364,942	294,000	265,000	195,600	698,230			
STANDARD COST OF SALES	309,479	272,000	282,000	209,000	343,954	277,000	253,000	184,000	646,433			
VARIATIONS FROM STANDARDS												
Labor and Variable Expense	2,041	2,000	2,000	2,000	(4,149)	(3,000)	(4,000)	(2,000)	(1,808)			
Fixed Expense	(2,287)	(4,000)	(5,000)	(3,000)	(8,462)	(2,000)	(4,000)	(2,000)	(13,719)			
Packing and Sleashing Materials	158				21				259			
Starting Up Expense	(1,215)	(1,500)	(1,500)	(1,000)	(968)	(1,000)	(1,000)	(100)	(2,483)			
Excess Waste	(619)	500	500	500	(101)				(790)			
Imperfect Cloth	548	500	500	500	886	500	1,000	500	1,804			
Sporadic Loss or Gain	8,707	2,000	3,000	2,000	(8,000)	1,000	2,000	1,000	2,707			
Storehouse Profit and Loss	(680)								(680)			
Extraordinary Cost of Bobbins	8,000								8,000			
Woon. Rayon Price Increase	-						2,000	2,000				
TOTAL COSTS	309,182	272,500	282,500	210,000	329,161	271,500	250,000	183,000	657,225			
P. & L. AS PER STATEMENT	$ 26,105	$ 23,500	$ 18,000	$ 11,000	$ 35,782	$ 23,500	$ 15,000	$ 12,600	$ 40,997			

* Figures in Parentheses Represent Minus Items

EXHIBIT 7

a figure to be arrived at as if the detailed items were figured as to yardage and costs so as to secure the total. However, when conditions prevent a reasonable estimate on the basis of margins, the controller uses the detailed standard costs.

Variations from Standard

Following the standard cost of sales, appears a list of variations from standards. These result from an anticipated failure to meet standards due to some unsual condition, such as a current or forecasted low water level which would mean that a higher proportion of power would have to be purchased than normally, due to the lowered generation of power by the Company's hydro-electric plant. The estimates for variations in the case of labor and variable expense are arrived at by reviewing the comparison reports and variable expense budget for estimated labor variances in the former case, and for such items as the power estimate in the latter case. The estimate of fixed expense variance is derived from a consideration of the anticipated relative level of activity, and is actually a volume variance. Packing and slashing materials have no forecasted variance, as a standard amount is budgeted and such variances as occur are of too small an amount to forecast. The starting-up expense variance is determined by a review of past reports of labor charges. This expense arises from the changing over of equipment from one style to another and is segregated because it is a large item. The estimate of excess waste is brought about through a review of variations in the quality of incoming material. A waste budget of standard allowances is operated, but control is largely a matter of machine setting. Estimated variances in the amount of imperfect cloth are made on the basis of a review of the conditions of yarns and a forecast of the number of learners who are to be working during the period. Seconds are measured against a standard, variations from which appear on this sheet. The next item, "Sporadic Loss or Gain," represents allowances for unusual or normally non-recurring items, made up primarily of inventory adjustments, such as those arising from cancelled orders which result in the necessity for repricing. The dyehouse profit and loss is not forecasted, as it is intended to be operated on an even basis. The item, "Woonsocket Rayon Price Increase," is self-explanatory,

being the anticipated price changes in rayon fibre affecting costs at the main mill.

Thus, by the use of the standards explained in the first section of this paper, weighted with knowledge of forward conditions, a dependable cost of goods sold is arrived at.

MANVILLE JENCKES CORPORATION & SUBSIDIARY COMPANIES

1. COMPARISON OF FORECAST TO ACTUAL PROFIT AND LOSS FOR MONTH ENDING December 31, 1939 [4 Weeks]

2. PRELIMINARY FORECASTED PROFIT AND LOSS FOR DECEMBER 1939 - JANUARY - FEBRUARY 1940

Exhibit _____ Sheet No. 518 Date December 12, 1939 Budget No. 40

MANVILLE MILL	COMPARISON OF BUDGED		FORECAST		
	FORECAST	ACTUAL	DECEMBER 4 WEEKS	JANUARY 5 WEEKS	FEBRUARY 4 WEEKS
COTTON GREY GOODS					
Gross Sales Before Discounts	$ 340,000.00	$ 387,077.82	$ 360,000	$ 510,000	$ 365,000
Actual Cost of Sales	309,000.00	308,101.94	279,120	387,600	310,000
GROSS PROFIT AND LOSS BEFORE SELLING	31,000.00	29,006.08	87,600	22,400	15,000
Selling Expenses	4,000.00	4,891.01	4,200	4,400	3,900
NET COTTON GREY GOODS PROFIT AND LOSS	26,400.00	24,105.07	83,400	18,000	11,000
RAYON GREY GOODS					
Gross Sales Before Discounts	362,000.00	371,162.02	300,000	370,000	280,000
Actual Cost of Sales	309,000.00	309,121.69	271,000	280,000	162,000
GROSS PROFIT AND LOSS BEFORE SELLING	53,000.00	61,991.01	29,000	90,000	17,000
Selling Expenses	2,000.00	8,199.01	2,000	2,000	4,400
NET RAYON GREY GOODS PROFIT AND LOSS	51,000.00	53,791.70	27,000	19,000	12,600
RAYON RESERVE ADJUSTMENT	(10,000.00)	(10,100.00)	(8,000)	(10,000)	(3,000)
GRAND TOTAL MANVILLE PROFIT AND LOSS	42,000.00	50,796.77	20,000	27,000	10,100
NET RAYON PLANT PROFIT AND LOSS	-	1,098.11	10,000	10,000	14,000
PROFIT AND LOSS BEFORE ADDITIONAL COSTS	42,000.00	51,892.88	42,000	42,000	25,100
ADD: OTHER EARNINGS					
Discount earned on Purchases	2,280.00	2,242.64	2,280	4,400	2,275
Interest earned on Rayon Plant Investments	5,000.00	5,019.47	5,000	5,000	5,000
Interest earned on Miscellaneous Investments	20.00	29.08	20	75	20
U. S. Bedding Profit	(100.00)	(242.41)	(250)	(400)	(250)
Village Income	-	22.00	-	-	-
Profit from Sales of Stores & Sundries	-	22.24	-	-	-
TOTAL EARNINGS	11,700.00	11,066.88	7,700	10,070	6,920
LESS: OTHER COSTS					
Interest Paid on Borrowed Money	1,170.00	1,198.00	1,000	1,000	1,075
Interest and Commission to Commercial Paper	6,100.00	6,304.99	6,700	6,000	6,700
Administrative Expense	9,000.00	9,000.00	6,000	6,000	6,000
Cash Discount on Sales	800.00	800.00	800	800	800
Loss from Sales of Capital Assets	2,000.00	2,215.38	1,000	-	-
Starting Up Costs - Wmsn. Rayon Company	2,000.00	-	-	-	-
TOTAL COST	21,220.00	19,017.00	15,400	14,970	12,600
NET ADDITIONAL COSTS	(10,020.00)	(8,050.00)	(8,700)	(4,900)	(4,970)
OPERATING P. & L. BEFORE INTEREST AND DEPRECIATION	32,020.00	42,930.00	30,970	21,000	20,000
Interest on 5% Note	(2,500.00)	(2,594.08)	(2,021)	(2,126)	(2,021)
OPERATING P. & L. BEFORE DEPRECIATION	31,020.00	39,020.74	28,024	28,074	22,024
Depreciation	(18,000.00)	(18,000.00)	(12,970)	(12,000)	(12,970)
NET CORPORATE OUTCOME AFTER ALL CHARGES	12,020.00	20,007.00	20,070	27,000	9,000
Provision for Federal Normal Income Tax	-	-	-	-	-
FINAL OUTCOME AFTER INCOME TAX PROVISIONS	$ 12,020.00	$ 20,007.00	$ 20,070	$ 27,000	$ 9,000

* Figures in Parentheses Represent Minus Items.

EXHIBIT 8

The Forecast Statement

From the working sheet, Exhibit 7, the total figures are carried over to the projected statement in Exhibit 8 with the result that cotton goods and rayon goods profit and loss may be shown separately. With the addition of the "Rayon Reserve Adjustment," the total Manville profit and loss is determined. The rayon reserve adjustment arises from the fact that the Woonsocket Rayon Company, operated as a subsidiary plant, sells its rayon to the Manville plant at going market prices in order to arrive at a true profit and loss from operations at the rayon plant. However, the stock of rayon at Manville must be marked down to the actual cost at the subsidiary plant, as the mark-up should not appear in the total profit and loss statement until it appears through actual sale.

All other items are self-explanatory, except starting-up costs, Woonsocket Rayon Company, appearing under other costs. When the forecast for November was made, the rayon plant was just getting under way after the settlement of a labor dispute. In order to begin operations, it was judged necessary to engage new hands who would have to be trained. The controller had entered an estimate of $5,000 in the forecast column for November after talking the matter over with the general manager of the rayon plant. Upon studying the forecasted statement for November, the president of the Company conferred with the general manager of the rayon plant and worked out a method of saving this outlay. Hence, the amount does not appear in the actual column for November and this figure accounts for the major difference between the total actual and the forecasted final outcome after income tax provision for November.

Conclusion

Several points stand out in this case study in budgetary control which it is felt will bear emphasis.

First, it is essential for the chief executive of the company to be thoroughly convinced of the value of the plan of budgetary control. In this case the president feels that the detailed operation of the plan can be delegated to the controller and budget director, but that the general supervision cannot be delegated to anyone.

The success of the budget depends to a very large degree upon the interest of the president and upon his ability to transmit this interest to the organization and to keep it really active.

Second, such a system would break down very rapidly without thorough co-operation from the entire organization. This co-operation must be actively maintained through encouragement and advice from the president.

In the third place, it is felt that the principle upon which this budget is based is of great importance. The use of the principle of units of service as opposed to the more common method of dollars of indirect labor per dollar of direct labor, or indirect labor measured against some other more or less common measuring stick, introduces an important factor. Where units of service are utilized, the expense becomes proportionately variable with changes in volume; and changes in the mix of products do not affect the validity of the budget. Where a common measuring stick, such as direct labor hours or dollars, is utilized, many labor expense items do not vary in proportion to volume changes, nor does the measuring stick apply to all accounts equally well. The use of units of service avoids this issue and leads to a budget which is accurate for the volume of work performed and the mix of products involved.

The fourth point of interest in this case is the philosophy of improvement evidenced by the emphasis on gains and the constant reductions in standards. The Manville-Jenckes Corporation has been able to stay in business as a result of the never ending program of cost reduction woven into the theory of the budget.

Fifth, the promptness with which reports reach the overseers and management is a point to be emphasized. By having the results of the previous week in the hands of the overseers by Tuesday of the week following, it is possible to take action on unfavorable variances in time to correct a bad situation in a minimum of time.

Finally, the administrative planning and control, made possible by the groundwork of dependable statistics, as illustrated by the projected profit and loss statement, insure that in these troublesome times of low visibility an intelligent course may be plotted with a maximum assurance of a satisfactory profit result.